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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/624,254	07/22/2003	George E. Kim	UC1.PAU.22	7355

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EXAMINER

AUSTIN, AARON

ART UNIT	PAPER NUMBER
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1775

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/05/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/624,254

Applicant(s)

KIM ET AL.

Examiner

Aaron S. Austin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 December 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 11-13, 25, 27, 28, 30, 31, 33, 34, 36-40, 43 and 45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 11-13, 25, 27, 28, 30, 31, 33, 34, 36-40, 43 and 45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/18/06 has been entered.

Claim Objections

Claim 36 is objected to because of the following informalities: the recitation of "formed achieved" in line 2 is redundant. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 11-13, 25, 27-28, 30-31, 33-34, 36-40, 43, and 45 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In particular, the claims include the restriction of a MCrAlY without the

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inclusion of other metallic alloys. This restriction is a negative limitation unsupported by the specification. Any negative limitation or exclusionary proviso must have basis in the original disclosure. If alternative elements are positively recited in the specification, they may be explicitly excluded in the claims. See *In re Johnson*, 558 F.2d 1008, 1019, 194 USPQ 187, 196 (CCPA 1977) ("[the] specification, having described the whole, necessarily described the part remaining."). See also *Ex parte Grasselli*, 231 USPQ 393 (Bd. App. 1983), *aff'd mem.*, 738 F.2d 453 (Fed. Cir. 1984). The mere absence of a positive recitation is not basis for an exclusion. See MPEP 2173.05(i).

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1 recites the limitation "the nanocrystalline bond coat" in line 9. There is insufficient antecedent basis for this limitation in the claim.

Claims 11-12 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: the relationship between the bond coat of claims 11-12 and the nanocrystalline bond coat of claim 1. In particular, claim 11 recites "a bond coat on the substrate" whereas claim 1 recites "the nanocrystalline bond coat". The distinction between the two is unclear.

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Claims 12 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: the relationship between the sprayed nanocrystalline alumina powder of claim 12 and the cryomilled alumina and MCrAlY composite of claim 11. The sprayed nanocrystalline powder of claim 12 appears to be the composite rather than the nanocrystalline alumina powder alone.

Claim 33 recites the limitation "the MCrAlY powder" in both lines 2 and 3. There is insufficient antecedent basis for this limitation in the claim.

Claims 43 and 45 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: the relationship between the MCrAlY bond coat and the other metallic metals. Lines 4-5 of claim 43 may be read as requiring no "other alloys on the substrate" rather than the disclosed invention of a MCrAlY bond coat without inclusion of other metallic alloys in the bond coat, said bond coat being formed on the substrate.

Claim 45 contains the trademark/trade name "model 1-S attritor". Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name. In the present case, the trademark/trade name is used to identify/describe an attritor model and, accordingly, the identification/description is indefinite.

Claim 45 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, claim 45 refers to "The method of claim 43" when claim 43 is a claim for a coating, not a method.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent

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granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1, 13, 25, 27, 37 are rejected under 35 U.S.C. 102(b) as being anticipated by Lavernia (US 5,939,146).

Lavernia teaches a method for improving a thermal barrier coating and coating produced thereby comprising cryomilling (column 5, lines 30-32) a CoCrAlY (column 6, line 21) and thermally spraying the product on a substrate (column 6, lines 20-26). A ceramic outer layer is deposited on the bond layer (column 6, lines 20-21).

Regarding claim 13, HVOF and other forms of thermal spraying may be utilized (column 6, line 65 to column 7, line 8).

Claims 1, 13, 25, 27, and 37 are rejected under 35 U.S.C. 102(e) as being anticipated by Hebsur (US 6,805,725).

Hebsur teaches a bond coat comprising NiAl and CoCrAlY which is cryomilled in nitrogen, and plasma sprayed onto a substrate. A ceramic top coat is formed over the bond coat. During cryomilling, AlN particles are formed in the bond coat and have a particle size of 10-50 nanometers. This is considered nanostructured. The bond coat is formed via a method that is commensurate with that of the instant specification; therefore the article is expected to share similar characteristics. The resultant bond coat product is compared to a CoCrAlY "under these conditions" (column 3, line 30). As the term "under these conditions" can be read to mean under the test conditions or under identical formation characteristics for an accurate comparison, the examiner

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takes the position that Hebsur teaches the CoCrAlY alone under identical formation characteristics for an accurate comparison as read in its broadest interpretation.

Regarding claim 37, the MCrAlY layer will be crystallized as like materials are used in a like manner to the claimed invention. Please note, the recitation of "nanocrystalline" is interpreted as meaning a crystalline form measurable on a nanoscale as no size limitation is provided by the claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 31 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lavernia (US 5,939,146).

Lavernia teaches a method for improving a thermal barrier coating and coating produced thereby as discussed above.

Lavernia does not teach multiple MCrAlY layers. It would have been obvious to one having ordinary skill in the art at the time the invention was made to duplicate the MCrAlY layer to form a first and second MCrAlY bond coat, since it has been held that mere duplication of essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

Regarding claim 33, as like materials are used in a like manner to that claimed, oxides, nitrides and/or oxynitrides will form.

Claims 38-40 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hebsur (US 6,805,725) in view of Hebsur et al. (US 5,635,654).

Hebsur '725 teaches a bond coating formed via cryomilling as discussed above, but does not teach formation of aluminum oxide during cryomilling.

Hebsur '654 teaches a bond coating similar to that of Hebsur '725, and further teaches that depending on the material system being used, cryomilling can be reacted with nitrogen or oxygen. As discussed in both patents, nitrogen forms AlN particles in the bond coating, and Hebsur '654 teaches that oxygen forms alumina on the powder particles. As Hebsur '654 teaches that NiAl may be cryomilled with oxygen or nitrogen depending upon the material system being used, it would have been obvious to one of ordinary skill in the art at the time of the invention that the bond coating of Hebsur '725 could also be cryomilled with oxygen. Furthermore, Hebsur teaches that the net result of milling NiAl in liquid nitrogen is an arrangement of fine particles of AlN, NiAl, and alumina on the NiAl powder surface (col. 2, lines 15-22). With this teaching it is expected that the bond coat of Hebsur '725 would already possess alumina particles in addition to the AlN particles.

Please note, the claims include product by process limitations in the claims. In particular, the use of alumina in the cryomilling process results in a product having alumina that is equivalent to a product having alumina formed in situ. The above

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arguments establish a rationale tending to show the claimed product is the same as what is taught by the prior art. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 227 USPQ 964,966. Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983), MPEP 2113.

Claims 31 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hebsur (US 6,805,725) in view of Cybulsky et al. (US 6,168,875).

Hebsur '725 teaches a bond coating formed via cryomilling as discussed above, but does not teach formation of a MCrAlY bond coat between another bond coat and a substrate.

Cybulsky et al. teach application of a MCrAlY bond coat between another bond coat and a substrate. Therefore, as Cybulsky et al. clearly teach a bond coat located between another bond coat and a substrate provides the advantage of oxidation and hot corrosion protection (column 2, lines 25-27), it would have been obvious to one of

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ordinary skill in the art at the time of the claimed invention to form the bond coat of Hebsur '725 over an MCrAlY layer overlying a substrate. Thus the claimed invention as a whole is *prima facie* obvious over the combined teachings of the prior art.

Further, it would have been obvious to one having ordinary skill in the art at the time the invention was made to duplicate the MCrAlY layer to form a first and second MCrAlY bond coat, since it has been held that mere duplication of essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

Regarding claim 33, as like materials are used in a like manner to that claimed, oxides, nitrides and/or oxynitrides will form.

Claims 34 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hebsur (US 6,805,725) in view of Cybulsky et al. (US 6,168,875), and further in view of Hebsur et al. (US 5,635,654).

Hebsur '725 in view of Cybulsky et al. teaches a bond coating formed via cryomilling as discussed above, but does not teach formation of aluminum oxide during cryomilling.

Hebsur '654 teaches a bond coating similar to that of Hebsur '725, and further teaches that depending on the material system being used, cryomilling can be reacted with nitrogen or oxygen. As discussed in both patents, nitrogen forms AlN particles in the bond coating, and Hebsur '654 teaches that oxygen forms alumina on the powder particles. As Hebsur '654 teaches that NiAl may be cryomilled with oxygen or nitrogen

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depending upon the material system being used, it would have been obvious to one of ordinary skill in the art at the time of the invention that the bond coating of Hebsur '725 could also be cryomilled with oxygen. Furthermore, Hebsur teaches that the net result of milling NiAl in liquid nitrogen is an arrangement of fine particles of AlN, NiAl, and alumina on the NiAl powder surface (col. 2, lines 15-22). With this teaching it is expected that the bond coat of Hebsur '725 in view of Cybulsky et al. would already possess alumina particles in addition to the AlN particles.

Please note, the claims include product by process limitations in the claims. In particular, the use of alumina in the cryomilling process results in a product having alumina that is equivalent to a product having alumina formed in situ. The above arguments establish a rationale tending to show the claimed product is the same as what is taught by the prior art. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 227 USPQ 964,966. Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983), MPEP 2113.

Response to Arguments

Applicant's arguments, see the Remarks, filed 11/27/06, with respect to the previous rejections under 35 USC 112. These rejections have been withdrawn.

Applicant's amendments with respect to rejection of claims 11, 12, 28, 30 over the Hebsur references have been fully considered and are persuasive. In particular, the addition of alumina during cryomilling as a method step in combination with cryomilling a MCrAlY without the inclusion of other metallic alloys is not found in the art of record. These rejections have been withdrawn.

Applicant's arguments filed 11/27/06 with respect to the remaining rejections of claims over prior art have been fully considered but they are not persuasive.

Applicant first argues the claims have been amended to recite addition of alumina rather than the in situ formation anticipated within the systems taught by Hebsur '725 and '654. To support the distinction in the final product, applicant points to cryomilling as only being conducted in liquid nitrogen. However, cryomilling may be performed in other elements such as argon, helium, neon, krypton, or xenon as well. Applicant suggests that the total in situ pick up of oxygen in nitrogen cryomilling is about 0.1 to 0.15 weight percent which might form in-situ alumina, but fails to provide support for this contention in the form of a reference or declaration.

Further, applicant argues the nano alumina added to the mixture is in the order of 2 weight percent which is higher than the amount formed in-situ. This argument is not commensurate with the claims.

Please note, claims 13, 31, 33-34, 36-40, and 43 include product by process limitations in the claims. In particular, the use of alumina in the cryomilling process results in a product having alumina that is equivalent to a product having alumina formed in situ. The above arguments establish a rationale tending to show the claimed product is the same as what is taught by the prior art. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 227 USPQ 964,966. Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983), MPEP 2113.

Still further, applicant argues Hebsur '725 does not teach formation "without inclusion of other metallic alloys" as set forth in the claims. However, the bond coat product of Hebsur '725 is compared to a CoCrAlY "under these conditions" (column 3, line 30). As the term "under these conditions" can be read to mean under the test

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conditions or under identical formation characteristics for an accurate comparison, the examiner takes the position that Hebsur teaches the CoCrAlY alone under identical formation characteristics for an accurate comparison as read in its broadest interpretation. Therefore a CoCrAlY with the claimed characteristics is taught as not including other metallic alloys. Moreover, the added limitation "without inclusion of other metallic alloys" appears to be unsupported by the specification (see the rejection under 35 USC 112 above).

Conclusion

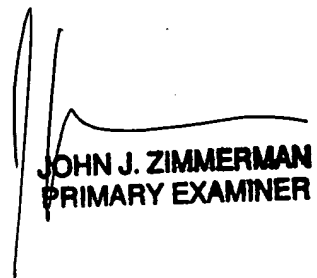
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron S. Austin whose telephone number is (571) 272-8935. The examiner can normally be reached on Monday-Friday: 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ASA



JOHN J. ZIMMERMAN
PRIMARY EXAMINER